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THE PRE-NURSING COURSE

SYNOPSIS OF REGULATIONS,
SUGGESTIONS FOR SYLLABUSES, EQUIPMENT AND BOOKS;
TOGETHER WITH FURTHER
RECOMMENDATIONS OF THE ASSOCIATION OF WOMEN
SCIENCE TEACHERS

(Revised Edition)

LONDON:
JOHN MURRAY, ALBEMARLE STREET, W.

Price 2s. 3d.

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CONTENTS

	PAGE
INTRODUCTION - - - - -	5
PART I. REGULATIONS PRESCRIBED BY THE MINISTRY OF EDUCATION AND BY THE GENERAL NURSING COUNCIL - - - - -	
1. Circulars issued by the Ministry of Education concerning the Pre-Nursing Course - -	7
2. Synopsis of these circulars, with comments	7
3. Application for approval of the courses in Schools - - - - -	11
4. Some useful publications of the General Nursing Council - - - - -	12
5. Examination of Candidates - - -	13
6. Examination Syllabus for Part I of the Preliminary State Examination for Nursing - - - - -	13
PART II. SUGGESTIONS AND INFORMATION OFFERED BY THE ASSOCIATION OF WOMEN SCIENCE TEACHERS AS REGARDS - - - - -	
1. Time Analysis - - - - -	16
2. Detailed Teaching Syllabuses - - -	16
Directions for obtaining those in Anatomy, Physiology, Hygiene, Actual Syllabuses prepared by the Association for Arithmetic Biology, Chemistry and Physics	
3. Practical work in Schools - - - -	26
4. Equipment - - - - -	27
5. Book List - - - - -	29
6. Reference Books - - - - -	31
7. Additional Book List in the Vocational and Ancillary Subjects - - - - -	32
8. Firms supplying Books, Charts and Equip- ment - - - - -	35
9. Bursaries and maintenance - - -	36
10. Information on the Pre-Nursing Course -	36
11. Recruitment - - - - -	36

PART III.	SYNOPSIS OF SOME PRE-NURSING COURSES IN	
	VARIOUS SCHOOLS - - - - -	37
	School 1 - - - - -	37
	School 2 - - - - -	38
	School 3 - - - - -	38
	School 4 - - - - -	39
	School 5 - - - - -	40
PART IV.	A BRIEF ACCOUNT OF THE WORK OF THE ASSO-	
	CIATION OF WOMEN SCIENCE TEACHERS IN	
	CONNECTION WITH THE PRE-NURSING COURSE -	41
PART V.	BEFORE THE PRE-NURSING COURSE - -	43
	Notes and suggestions for syllabuses for age range	
	thirteen to fifteen years - - - -	

INTRODUCTION.

THIS brochure replaces the first edition of "The Pre-Nursing Course," published by the Association of Women Science Teachers in 1943. The demand for that edition proved so great, that it was decided in 1946 to bring the whole publication up to date as soon as possible after the post-war announcement of the Ministry of Education and General Nursing Council on teachers' qualifications for the Pre-Nursing Course in schools. This announcement was made in the Ministry of Education circular 105, on May 14th, 1946.

Many secondary schools are now recognised for the purpose of holding a Pre-Nursing Course and for preparing their pupils to take Part I of the Preliminary State Examination. Owing to the raising of the school leaving age many more schools are seeking to offer such a course to those girls who look upon nursing as their vocation and future profession. The present brochure collects together within one cover the many aspects of such a course—regulations; syllabuses, both examination and complementary; advice on equipment, books and courses. The demand for such a publication comes from headmistresses, teachers and teaching nurses, and it is to these and to all those who are concerned with the Pre-Nursing Course in school, both from the administrative and teaching aspects, that the present brochure is addressed.

The original Pre-Nursing Course sub-committee of the Association of Women Science Teachers has been altered and enlarged and the following are the names of those who served on this committee for the production of this brochure in 1947:—

Miss P. M. Taylor, Lecturer in Health Education, Homerton College, Cambridge (Chairman).

Miss L. E. Higson, Secretary, Association of Women Science Teachers (Secretary).

Miss C. P. Jones, Science Mistress, Holly Lodge High School, Smethwick.

Miss F. R. M. Peacock, Science Mistress, Technical School for Girls, Fort Pitt, Chatham, Kent.

Miss J. K. Raeburn, Science Mistress, North London Collegiate School.

Miss C. Richardson, Science Mistress, Wyggeston High School for Girls, Leicester (co-opted).

Miss N. M. Whitworth, Lecturer, The Training College, Leicester (co-opted).

Miss W. M. Casswell and Miss M. Bowen originally served on the committee responsible for the first edition of the brochure, and Mrs. G. Masters has been an interim member.

The terms of reference of the sub-committee are to consider all aspects of the Pre-Nursing Course in Schools. The present publication is one piece of this sub-committee's work. Reference to its further activities, which may be of use to all interested in the course, will be found in Part IV of this publication.

The sub-committee, on behalf of the Executive Committee of the Association of Women Science Teachers would like to thank all those who have given advice and criticism, and in particular

The Ministry of Education,

The General Nursing Council,

The Royal College of Nursing, Sister Tutor Section, for advice on Syllabuses and on Firms supplying Books, Charts and Equipment.

The Royal College of Nursing, Sub-committee of the Nursing Reconstruction Committee, for permission to publish the Physics Syllabus.

The National Society of Children's Nurseries, for permission to quote from the Report "Training in Child Welfare."

Miss M. M. Edwards, Nursing Recruitment Service.

Miss P. Pemberton, for advice on the Books Section.

Members of the Battersea Course, 1945, for help in compiling the Syllabuses in Arithmetic, Biology and Chemistry.

Miss M. Houghton, Education Officer, General Nursing Council.

Miss W. M. Casswell (Past President of the Association of Women Science Teachers), Head Mistress, Edgbaston High School, Birmingham.

The Headmistresses and the Headmasters of the five schools who allowed us to publish time-analyses of their Pre-Nursing Courses.

PART I.

REGULATIONS PRESCRIBED BY THE MINISTRY OF EDUCATION AND BY THE GENERAL NURSING COUNCIL.

1. Circulars issued by the Ministry of Education concerning the Pre-Nursing Course.

Since 1939, three circulars have been issued by the Ministry up to the date of publication of this brochure, namely C 1471, C 1568, and C 105.

2. Synopsis of these circulars, with comments.*

C 1471, 14th July, 1939, with Appendix (see pages 13-15) addressed to Local Education Authorities and Governing Bodies of Secondary Schools and Colleges for Further Education.

This Circular and its appendix (the syllabus) is paraphrased in the following paragraphs, as it contains the vital information upon the conditions under which the Ministry of Education are prepared to recommend to the General Nursing Council for approval, Pre-Nursing Courses in recognised schools.

Paragraph 1 explains the decision of the General Nursing Council to divide their Preliminary Examination into two parts, Part 1 of which may be taken before entering into a Training School of a Hospital. The advantages accruing to the individual entrant and to the nursing profession are stressed.

Paragraph 2 urges Local Education Authorities and Governing Bodies to establish courses leading up to part I of the Preliminary Examination.

Paragraph 3 explains that only students who qualify by attendance at approved courses may sit for the examination from their schools. This means that the school Pre-Nursing Course *must be submitted to* the Board of Education for recommendation of approval by the General Nursing Council (H.M. Inspectors will be ready to assist Authorities in framing courses of instruction). The Board of Education will inform the responsible body of the school whether the course has been recommended by them for approval by the General Nursing Council and in due course whether it has been approved. The form of application for approval is Form 19 S/T.

*Nomenclature used is that employed in C 1471 and C 1568 which were published prior to the Education Act, 1944.

Paragraph 4 states that the whole-time Pre-Nursing Courses must not be less than one school year and part-time courses of not less than two sessions, each session being of at least two terms' duration; that 17 years is the minimum age for admittance to the examination; that the examination is held in February, June and October of each year; and that not more than two years may elapse between passing the examination and entering into a Training School of a Hospital.

Paragraphs 5-7 deal with the recommendations of the Board of Education for the Pre-Nursing Course in Secondary Schools. Girls doing a one-year course need not necessarily have obtained a School Certificate, but should be suitable for the profession and possess proficiency in English and Arithmetic. The curriculum should include:

(a) The special subjects of Anatomy, Physiology and Hygiene (see Appendix to the Circular) occupying, together with Elementary Physics, Chemistry and Biology to aid the course, approximately one-third of the weekly time-table of the course: the Elementary Science subjects may be omitted or continued at a more advanced stage as general education subjects, provided that an adequate course in Science has already been completed.

(b) General education with emphasis on Arithmetic, Cookery and General Reading, including books on the history of Nursing and Medicine. Particular attention should be paid to what is said in Paragraph 6 (b) of the Circular with regard to the nature of the instruction in Arithmetic.

A two-year course, comparable with that of the Higher School Certificate in standard, may similarly also be provided.

As only certain schools will be able to provide these courses, pupils should be transferred where necessary to such appropriate schools.

Paragraphs 8-11 deal similarly with part- or whole-time courses in Technical Schools for those already in employment or for those who have left school and are without employment.

Paragraphs 12 and 13 call attention to special modified arrangements that may be made for rural areas and smaller urban areas. In rural areas girls from Public Elementary Schools may be transferred to the Secondary School at 13, or exceptionally at 16 years,

with a view to taking the Pre-Nursing Course. In smaller urban areas the Secondary and Technical Schools may have to combine the Pre-Nursing Course.

Paragraphs 14-16 relate to the Teaching Staff, but as the position has altered recently in this connection, the present regulations for Teaching Staff are best perused from Circular 105, 14th May, 1946.

Paragraph 15 recommends Local Authorities to provide supplementary courses in Anatomy, Physiology and Hygiene for their Science teachers.

Circular 1568, 29th October, 1941, with its Addenda of 7th May and 12th August, 1942, addressed to Local Education Authorities and Governing Bodies of Non-provided Secondary Schools (including Efficient Schools)—Girls and Mixed—and Non-maintained Technical Schools, etc.

This circular contains information supplementing Circular 1471.

Paragraph 1 calls attention to the fact that up to 1941 applications for approval of Pre-Nursing Courses in secondary and technical schools have been fewer in number than was expected.

Paragraph 2 explains that the title Pre-Nursing Course refers to a particular restricted group of pupils in certain schools and that it in no way refers to courses attended mainly or exclusively by student nurses or probationers who are concurrently undergoing practical training in nursing duties in hospital wards. It also states that "The General Nursing Council are not prepared to extend these arrangements to courses organised on the basis (1) of practical training in hospital wards being associated with the course instruction, or (2) of instruction in the special professional subjects of the course being given to the students together with nursing probationers at hospitals. No objection is taken to occasional visits of Pre-Nursing Course students to hospitals for purposes of observation and explanation."

Paragraphs 3-5 and the Addenda relate to additional groups who are qualified to teach pupils in schools for the Pre-Nursing Course. Again this information must be reviewed in the light of Circular 105.

Paragraph 6 states that girls of fifteen years of age are too young for entry upon a Pre-Nursing Course, but also states that the General Nursing Council are prepared to approve a minimum age of admission of fifteen and a half years in the case of part-time Pre-Nursing Courses of two years' duration.

Paragraph 7 refers to the holding of the examination only twice a year, in April and September, for the war years after April 1941.

Circular 105, 14th May, 1946, with its Addendum of 3rd December, 1946, addressed to Local Education Authorities and Governing Bodies of transitionally assisted, direct grant and recognised efficient Secondary Grammar Schools (Girls and Mixed), and non-maintained Technical Colleges, etc.

This circular regularises the position of the Pre-Nursing Courses up to this date.

Paragraph 1 urges upon Local Education Authorities the importance of establishing as large a number of Pre-Nursing Courses as possible, in order that many potential recruits shall not be lost to the nursing profession because they leave school early and take up other employment. The Ministry of Education stresses the value of part time courses in establishments for Further Education. The Ministry of Health has already asked hospital authorities to approach Local Education Authorities where Pre-Nursing Courses are not yet held. (Circular 162/45).

Paragraph 2 states that circulars 1471 and 1568, with addenda, still apply subject to alterations mentioned in the following two paragraphs.

Paragraph 3 mentions the classes of teachers who are now qualified to take the professional subjects of Anatomy, Physiology and Hygiene and that for convenience of reference a full statement of the classes of teachers is set out in the Appendix. (See below).

Paragraph 4 states that the dates of the Preliminary examination Part I for the General Nursing Council have now been altered and that in future this examination will be held in the months of February, June and October. "Candidates attending Pre-Nursing Courses due to terminate at the end of the summer term and who have reached the age of 17 years by the last day of June will be allowed to take the examination in June subject to an undertaking by the school authorities that the candidates will complete their course of instruction."

APPENDIX TO CIRCULAR 105.

(Classes of Teachers now qualified to teach the professional subjects).
Anatomy, Physiology and Hygiene.

1. Registered medical practitioners.
2. Science teachers whose Degree course included Anatomy and Physiology or who have taken a course for teachers in these subjects under properly qualified specialists.

3. Science teachers holding a degree which includes as one of its final subjects either Biology or Zoology.
4. Registered nurses possessing the Teacher's Certificate in Massage and Medical Gymnastics of the Chartered Society of Physiotherapy.
5. Holders of the Diploma of one of the following Physical Training Colleges:—Anstey, Bedford, Bergman-Osterberg, Chelsea, Liverpool and Nonnington Physical Training College for Women, provided that they hold in addition the Teacher's Certificate in Massage and Medical Gymnastics of the Chartered Society of Physiotherapy.
6. Sister Tutors who hold a Certificate of registration as a qualified Sister Tutor issued by the General Nursing Council.
7. Holders of the Physical Training Diploma of the London University.

Anatomy and Physiology only.

Holders of the Teacher's Certificate in Massage and Medical Gymnastics of the Chartered Society of Physiotherapy.

Hygiene only.

1. Teachers holding a Science Degree.
2. Teachers who have successfully passed through their training at Training Colleges of Domestic Subjects recognised by the Ministry of Education.
3. Holders of the Diploma of one of the following Physical Training Colleges:—Anstey, Bedford, Bergman-Osterberg, Chelsea, Liverpool and Nonnington Physical Training College for Women.
4. Health Visitors holding the Health Visitor Tutor's Diploma, or the Diploma in Nursing (Elementary Economics, Sociology and Hygiene section) or a recognised teaching qualification. (Subject to the approval of the Minister of Education).

3. Application for approval of Courses in Schools.

Form 19 S/T is the Ministry of Education form upon which particulars of the school's Pre-Nursing Course must be submitted to the Ministry for consideration. It requires amongst other things that the following shall be entered or enclosed:

Estimated number of pupils taking the course.

Names and qualifications of the teachers of Anatomy, Physiology and Hygiene. It is most important that the qualifications should be fully stated.

Minimum age of admission to the course. In a Secondary School course the General Nursing Council will expect this to be 16 years.

Detailed syllabuses for the professional subjects in the course (if other than those prescribed by the General Nursing Council) and for the ancillary Elementary Physics, Chemistry and Biology.

Full time-table of the course showing by periods per week the amount of time proposed to be given to the various subjects of the course including the general educational subjects.

The Appendix to Circular 1471 gives the syllabus prescribed by the General Nursing Council for Part I of the Preliminary Examination. (See pages 13-15).

The number of candidates in the Pre-Nursing Course does not appear to affect the above issues. It should be stressed that attendance of pupils at a local Hospital for professional instruction in practical nursing is not accepted by the General Nursing Council as part of a Pre-Nursing Course and that instruction in the special professional subjects should not be given to the students together with student nurses at Hospitals (see paragraph 2 of Board of Education Circular 1568).

4. Publications.

Some useful publications of the General Nursing Council to be obtained from the Offices of the Council, 23, Portland Place, London, W.:

- (a) *Rules framed by the General Nursing Council for England and Wales under the Nurses' Registration Act, 1919.* Price: One shilling.
- (b) *Syllabus of Lectures and Demonstrations for Education and Training in General Nursing.* Price: One shilling and sixpence.
- (c) *Syllabus of Subjects for Examinations for the Certificate of General Nursing.* Price: Ninepence.
- (d) *Regulations for Conduct of Examinations.* Price: Threepence.
- (e) *List of Schools and Technical Colleges conducting Pre-Nursing Courses approved by the General Nursing Council for England and Wales, 1945.* Price: Two shillings.

5. Examination of Candidates.

The Pamphlet *Regulations for Conduct of Examinations*. Price Threepence, obtainable from the General Nursing Council, gives all details regarding matters of the examination. These may be summarised as follows:

Candidates for examination must be 17 years of age. (But see page 10, paragraph 4).

The fee is £1 10s. 0d. As from the October, 1949, Examinations the fee will be £1 15s. 0d.

The examination is held in February, June and October. Candidates who are due to complete a Course in July are permitted to enter for the June examination provided that an assurance is received from the Head Mistress that the candidate will complete the Course.

There is one theory paper of two hours on Elementary Anatomy, Physiology and Hygiene; three out of five questions must be answered in the section on Elementary Anatomy and Physiology and one out of three in the section on Hygiene. There are no compulsory questions.

There is an oral examination in the above subjects of fifteen minutes' duration conducted by an examiner in Anatomy and Physiology and an examiner in Hygiene.

If a school is recognised for the Pre-Nursing Course, the school should make application, about three months before the examination for details of dates, for entrance forms and for a list of examination centres.

Application forms comprise the following:

- (a) Certificate of Instruction to be filled in by the Head Mistress.
- (b) Entrance Form to be filled in by the Candidate.

The Candidate's Birth Certificate is required.

An interview for obtaining entrance to the nursing profession at hospital is quite distinct from the examination under discussion.

6. Syllabus prescribed by the General Nursing Council for Part I of the Preliminary Examination.

I. Elementary Anatomy and Physiology.

THE HUMAN BODY

General View.—Cells, tissues, organs; their arrangement and structure. The body as a whole. Chief cavities and their contents.

THE SKELETON

Bone.—Structure and growth. Varieties of bones.

Skull.—Names, position, and brief description of bones of cranium and face. Formation of orbit, nose, mouth. Teeth.

Spinal Column and Thorax.—General character of vertebrae; varieties; the column as a whole, its curves, inter-vertebral discs. Sternum, ribs and costal cartilages.

Shoulder Girdle and Upper Extremity, including bones of wrist and hand.

Pelvic Girdle and Lower Extremity, including bones of ankle and foot.

JOINTS AND MUSCLES

Joints.—Formation, including cartilages, ligaments, synovial membrane; varieties, mechanism; chief joints in body.

Muscles.—Their general features; voluntary, involuntary, cardiac; their mode of action. The position and action of the chief muscles of the body.

BLOOD AND CIRCULATORY SYSTEM

Blood.—Composition, functions; coagulation.

Heart.—Position, structure, function. Auricles and ventricles, Valves.

Blood Vessels.—Arteries, veins and capillaries; their structural differences. Name and position of the chief vessels.

Circulation of Blood.—General, pulmonary, and portal circulations. Pulse. Blood pressure.

Lymphatic System.—Lymphatic vessels. Glands. Thoracic duct. Lymph.

Spleen.

RESPIRATORY SYSTEM

Organs of Respiration.—Position, structure, function.

Mechanism and Process of Respiration.—The chief muscles concerned in respiration. Purpose of respiration; relation to circulation.

DIGESTIVE SYSTEM

Alimentary Tract.—Position, structure and functions of component parts and related glands.

Foodstuffs and Accessory Food Factors.—Normal diet of man. Composition of milk.

Processes of Digestion and Absorption.

METABOLISM

Fate of Foodstuffs in the Organism. Body heat; regulation of body temperature.

EXCRETORY SYSTEM

Bowel.—Composition of faeces. Defaecation.

Kidneys and Bladder.—Structure and functions. Urine. Micturition.

Skin.—The epidermis; the dermis. Sweat glands. Hair and nails. Functions.

EXDOCRINE SYSTEM

Pancreas, Thyroid, Suprarenal and Pituitary Glands. Position and function.

NERVOUS SYSTEM

Central Nervous System.—Cerebrum. Cerebellum. Medulla. Spinal cord. Organs of special sense, cranial and spinal nerves. Reflex action.

Autonomic or Sympathetic Nerves.

REPRODUCTIVE SYSTEM

Generative Organs.—Position, structure, function.

II. Hygiene.

Air.—Its composition and impurities. The principles of ventilation natural and artificial, and their application to houses and hospitals. Atmospheric pressure. Radiation and evaporation.

Water.—Sources. Hard and soft water. Treatment of water for domestic use. Relation of impure water to the spread of disease.

Milk.—Composition, sources of contamination, adulteration, storage and preservation.

Disposal of Refuse.—Various methods in use. Dry and water systems. General arrangements of house and hospital drainage.

Personal Hygiene.—Habits. Exercise. Rest and recreation. Cleanliness. Clothing. Parasites.

Infection.—Its nature, sources and modes of transmission. Insects and other parasites. Methods of disinfection.

Heating.—Of houses and hospitals.

Lighting.—Natural and Artificial.

Hygiene of the Ward and Sick Room.

PART II.

SUGGESTIONS AND INFORMATION BY THE ASSOCIATION OF WOMEN SCIENCE TEACHERS AS REGARDS TIME ANALYSES, TEACHING SYLLABUSES, PRACTICAL WORK, EQUIPMENT, BOOKS, MAINTENANCE GRANTS, RECRUITMENT AND OTHER GENERAL INFORMATION.

1. **Time Analysis.** The Ministry of Education's plan for the balance between the professional subjects (one-third of the course) and the general education subjects is a good arrangement in practice. Where possible, applications to nursing should be stressed in the teaching of the professional subjects, while the general subjects should not be of too academic a nature. A synopsis of the Sixth-Form Nursing Course time-table from four schools is appended. Visits to local hospitals to see different aspects of the work should give a realisation of the ultimate nature of the nurse's work.

The reports of the Association of Women Science Teachers on "Science in Post-Primary Education," Parts 1 and 2, will be found to be most useful for providing suggestions for background studies.*

2. **Syllabus.** The General Nursing Council's syllabus in Anatomy, Physiology and Hygiene for Part 1 of the Preliminary Examination as it appears in the Appendix to Circular 1471 is quoted on pages 13-15. Members of the Association of Women Science Teachers are recommended to write to the Secretary of the Association of Women Science Teachers for the loan of various detailed syllabuses made by teachers of experience. †

The general education varies with the time which can be allotted to it. In a Sixth Form where the Course is for one year the general education can be wide and deep. It usually covers English, Scripture, History, Cookery, Arithmetic, Physics, Chemistry and Biology. In a Two Year Part-time Course for students already in employment, the limited time means inevitably a restricted general education. In the latter case, an attempt is usually made to give students a background through a wide English syllabus and sufficient Arithmetic, Cookery and General Science to provide a firm foundation for the professional subjects.

* John Murray. Price: Part I, 1s. 4d., Part II, Members of A.W.S.T., 1s. 6d., Non-Members, 2s. 2d.

† Miss L. E. Higson, 11, Fillebrook Hall, Fillebrook Rd., Leytonstone, E.11.

In addition to the professional subjects, the Association of Women Science Teachers recognises the importance of other science subjects in the Pre-Nursing Course. It has accordingly constructed the following syllabuses in Arithmetic, Biology, Chemistry and Physics,* all of which have been freely criticised by practising teachers and sister tutors of the Pre-Nursing Course.

SUGGESTED SYLLABUS IN ARITHMETIC.

Introductory Notes.

The course aims primarily at giving the future nurse practice in a wide range of simple arithmetical processes so that she may have the necessary background to carry out all calculations connected with her duties speedily and accurately. In addition it attempts to give her an understanding of some of the applications of Arithmetic to modern life.

Hence, a simple syllabus is suggested for use in both whole- and part-time courses. This has been set out in a concise form in order to serve as a guide to the range of work with which pupils should be familiar by the end of the course.

It is not intended that the subject should necessarily be studied in the order stated, but it is expected that practice in the various sections of the syllabus will be obtained by the application of arithmetical principles to problems arising in other branches of the Pre-Nursing Course and also in daily life.

Therefore it is recommended that the Arithmetic should be taught in connection with the physics course and that practical work should be carried out whenever the facilities are available.

Notes have been appended to the syllabus to indicate some of the physics topics in which close correlation with Arithmetic is essential and also the material which could be included in a citizenship section of the course.

The method of teaching should be such that adequate stress can be laid on oral and "drill" work to enable those attending the course to achieve a good standard of speed and accuracy in mental calculations.

Probably only two periods per week in a full-time course of one year can be given to Arithmetic. This should be sufficient to cover the ground, even if the pupils have not reached school certificate

* Syllabus in Physics compiled with the Royal College of Nursing (Education and Training Sub-Committee of the Nursing Reconstruction Committee) and with the Science Masters' Association (Co-ordination and Guidance Committee for the Teaching of Physics).

standard in Arithmetic; and it should allow those of good ability to devote a considerable amount of time to the wider applications of the subject.

The Syllabus.

Numeration and Notation.

Number, four rules.

Money, four rules, reduction.

Vulgar fractions.

Decimal fractions.

Weights and measures of the British and Metric Systems, including those used in Pharmacy, interchange of units of measurement.

Mensuration. Simple proportion.

Percentages. Graphs.

Notes.

1. The subject should be taught in connection with the Physics course so that as much of the syllabus as possible is based on practical work in the following:—

Temperature scales. Conversion of temperature scales.

Temperature Charts.

Measurement of length, area and volume.

Density and specific gravity determination.

Archimedes principle.

Hydrometers, including lactometer and urineometer.

Dilution of solutions.

Levers. Pulleys.

Gas and electric meters. Fuel costs.

2. Other topics in the syllabus should form the basis of a course in the Arithmetic of Citizenship which would include:—

Simple interest.

Simple accounts. Post Office and National Savings.

National Health and Unemployment Insurance. Fire, Life and Endowment Insurances.

Local Government Finance. Expenditure—Rates—Rateable values.

National Finance. Budgets. Customs and Excise. Income Tax, including Pay-as-you-earn and Post-war credits.

Graphs of population and health statistics, including the use and making of isotypes.

SUGGESTED SYLLABUSES IN BIOLOGY.

A. *The Problem and its solution.*

The purpose of this course is to give a general biological foundation for the more specialised study of human physiology and anatomy.

The problem is, first the selection of the essentials of such a foundation, and second, the adaptation of this to the students who join the Pre-Nursing Courses.

The essentials selected are shown in the accompanying syllabuses.

The pupils who enter the Courses vary greatly in capacity, experience and knowledge, for some pupils have previously taken no Biology at all (some having even specialised for a year or more on the Arts side), while others have taken it to School Certificate level whether they passed the examination or not. Two Syllabuses, I & II, are suggested therefore, I for those pupils with no previous Biology, containing the essentials of a general biological foundation, II for those pupils with previous Biology, containing further topics and applications of interest and importance.

It is not considered essential that pupils should join this latter course since time does not always allow, but where it can be arranged it is much appreciated and proves stimulating and useful. It is regarded as essential that pupils should have covered Syllabus I at some time or other.

For a one-year course, Syllabus I should have two or three periods a week, and Syllabus II one or two periods.

B. *Presentation.*

There must be correlation of biology with physiology and anatomy especially, and also with Dietetics, Hygiene and Physics and Chemistry.

Technique and outlook must be suited to the developing maturity of the pupils. With Syllabus I a wide range of material and experiments should be used as illustrations of the facts under consideration, with the minimum of recording. Syllabus II should include preparation both individually and in team work, of topics and lecturettes, with discussion and some practical work.

The topics suggested should form a basis for further selection to suit the individual circumstances, so that while some may receive fuller treatment than others, yet all will have been considered by the end of the course which will thus preserve its balance.

C. *Syllabuses suggested.*

I. *For those with no previous Biology.*

N.B. It is essential that these topics should be taken in relation to their purpose, *viz.*: as providing a general setting for, and elucidation of, the special features shown by man and his relation to his environment. The order of these topics is NOT necessarily their teaching sequence.

1. (a) Range of plant and animal life. (Field work and collections; simple survey).
- (b) Haunts of plant and animal life including simple physical properties of water, land (soil) and air which underlie their characteristics as media for life (*e.g.*, soils and houses).
- (c) Protoplasm, cells and tissues.
- (d) Vital processes in general, and characteristics of living, non-living and dead organisms.
2. Bio-physics—simple study of diffusion, osmosis, solution, &c.; and bio-chemistry—simple properties of and tests for carbohydrates, fats and proteins (correlated with other science lessons and with the following sections).
3. Vital functions in green flowering plant and any mammal, together with as much structure as is needed for their understanding and for correlating with the human body work.
 - (a) Respiration: in the tissues—chemical process; exchange of gases with surrounding media; transport of all materials concerned. Significance.
 - (b) Nutrition (i) of plant: absorption; photosynthesis, further elaboration of food; transport; storage; enzyme action and its characteristics.
(ii) of animal: ingestion; digestion; absorption; assimilation; transport; regulation and stimulation of enzymes at each stage; peristalsis.
 - (c) Excretion and water balance (to include transpiration and turgor in plants, and the importance of blood composition in animals).

- (d) Growth: increase in number of cells, in size, in weight and in development (specialisation, division of labour and increasing capacities). Conditions needed for healthy growth; regions and seasons of growth. Healing and regeneration. Cell division in outline.
 - (e) Movement: levers; muscles and their action in general.
 - (f) Sensitivity and co-ordination: the chief stimuli, and the reactions of protoplasm in general to each. Tropisms and tactic movements in plants. Receptors and conduction of impulses in animals; simple reflex, sensory, and motor paths; brain co-ordination of these at various levels—*viz.*: primitive brain, old brain, new brain; sympathetic system and its importance. Chemical co-ordination: hormones and endocrine organs; its importance.
 - (g) Reproduction: vegetative and by seeds in plants; sex in animals; dependence and care of offspring.
4. Growing to pattern: variation; heredity; evolution.
5. (a) Ways of living: holophytic and holozoic (as above); symbiosis and commensalism; parasitism (as foundation for work on bacteria and other parasites); saprophytism; insectivorous plants, etc.
- (b) Interdependence of green plants, animals and non-green plants.
 - (c) Sources of food, and especially food plants of human use.
 - (d) Rhythm in life: seasonal; reproductive; sleep, rest and activity, etc.
 - (e) Conditions for healthy living.

II. *For those with previous (School Certificate) Biology.*

1. Comparative Physiology (with enough Anatomy for its understanding) of vertebrates chiefly, correlated with their mode of life, as a setting for the special features of the human—*e.g.*, fish, frog (reptile), bird, mammals, in relation to their life in water, on land, and air, with reference chiefly to their coverings and shape, movement, breathing, body temperature and life history. Problems of life on land, as compared with that in water. (Include osmotic regulation, evaporation, etc.).

2. Evolution: facts, theories, and their effects on contemporary thought.

Heredity and its social repercussions.

Environment: effects and importance.

Physical basis of personality.

3. Great discoveries and their consequences, *e.g.*, disinfectants, anaesthetics, vitamins, chemotherapy, rehabilitation, conditioned reflexes (Pavlov's dogs), etc.

The discoverers: Harvey, Leeuwenhoek, Pasteur, Lister, Jenner, Banting and Best, Florey and Fleming.

History of medicine and nursing; some great nurses and hospitals.

4. A piece (or pieces) of practical "research" involving continued observational work with some detailed recording and tabulation of results, over a period of several months at least.

Making of working models or some useful piece(s) of apparatus.

SUGGESTED SYLLABUS IN CHEMISTRY.

Note:—The object of this course is to provide the background of Chemistry necessary for the full understanding of the Syllabuses in Physiology and Hygiene for Part I of the State Preliminary Examination for Nurses.

Since some students enter Pre-Nursing Courses without having previously studied Chemistry or General Science to the standard of the school certificate examination, a minimum syllabus is here set out together with suggestions of further topics (*in italics*) which could be included by those who start with a good background of knowledge.

In either case it should be possible to cover the syllabus in an eighteen months' course of one double period per week, or its equivalent.

Although for convenience syllabuses in Physics and in Chemistry are published separately, in actual practice it is probably better, where staffing allows, for one teacher to take a combined course of Physics and Chemistry.

The importance of correlation in Chemistry and Physics with the Physiology, Hygiene and Arithmetic is emphasized.

It is not suggested that topics need necessarily be taken in the order stated. Emphasis throughout should be on the qualitative

aspect of the subject, and the course should include as much practical work in the manipulation of simple apparatus as possible.

Suggested Syllabus.

Classification of matter as solids, liquids and gases. Simple explanation of their properties in terms of molecular movement.

Elements, compounds and mixtures. Constancy of composition of compounds. Idea of atoms in so far as it assists in giving a mental picture of a chemical reaction.

The constituents of the atmosphere and their relation to the life of animals and plants. Contamination of the atmosphere. Protection of metals from corrosion. Liquid air. Rare gases. Ozone.

Combustion. Sources of energy, present and future. Coal, coal gas, flame smoke abatement. Carbon monoxide, its physiological effect and the conditions under which it is likely to be produced in everyday life. Water gas, methane, acetylene.

Carbon as a fundamental constituent of organic matter. Carbon dioxide produced by combustion of most ordinary substances including food materials. Other sources of this gas. The carbon cycle in nature. Everyday uses of carbon dioxide.

Elementary properties of sugars and starches. Tests for mono- and disaccharides. Fermentation. The chemistry of digestion of carbohydrates in simple outline. Alcohols, glycerol, ethers. Soaps, fats and oils. The digestion of fats; tests for fats.

Aldehydes and ketones—very elementary treatment, but with special reference to acetone. Roth's test for acetone.

Acids, bases and salts. Identification of simple acid radicals. Chemistry involved in First Aid treatment of burns and poisons.

Nitric acid. Ammonia. The nitrogen cycle in nature and how the nitrogen problem has been solved.

Organic acids—acetic, lactic, etc. *Amino Acids*. The digestion of proteins and tests for proteins. *Urea*.

Water—its importance as a solvent, evaporation and crystallisation. The water supply of a community, purification and softening.

Oxidation and reduction—the use of oxidising agents as antiseptics and disinfectants.

The elementary chemistry of sulphur, phosphorus. Chlorine and Iodine and their simple compounds.

Elementary study of the Periodic Table leading to a simple account of modern ideas of the structure of the atom. X-rays. Radio activity (if not done in Physics course).

Simple outline of the theory of Ionisation. pH. Reversible reactions (very simple treatment). Simple experiments to illustrate surface tension, capillarity, diffusion and osmosis (if not done in Physics course). Their importance in natural phenomena (qualitative treatment only).

Elementary study of colloids.

Coal tar and a few of its more important compounds.

Study of as many substances in common medicinal use—drugs, disinfectants, antiseptics, insecticides, anaesthetics, poisons, etc.—as time allows.

Chemistry of food storage.

Chemistry of sewage and salvage disposal.

Elementary exercises in titration together with sufficient chemical theory for the understanding thereof.

Urine analysis.

Organic solvents and stain removal.

Plastics.

Rubber.

Determination of calorific values of foods.

If there exists no Science Discussion Class for Arts and Science VIth, it will probably be found that students welcome the provision of time for discussions on the application of science to everyday life, etc.

SUGGESTED SYLLABUS IN PHYSICS.

The whole of this section is reprinted here from pages 48 and 49 of the "Nursing Reconstruction Committee Report, Section II," by kind permission of the Royal College of Nursing.

The syllabus outlined was approved at a joint meeting of members of the Education and Training Sub-Committee of the Nursing Reconstruction Committee, the Association of Women Science Teachers (Sub-Committee on Pre-Nursing Courses), and the Co-ordination and Guidance Committee for the Teaching of Physics. The subject matter of the syllabus is to be studied as far as possible by experimental work in the laboratory, and the practical applications

stressed throughout. The quantitative aspects are of less importance and mathematical treatment can be avoided.

Measurement of length, volume, mass.

Density and specific gravity. Hydrometers.

Fluid pressure. Syringe. Syphon.

Levers. Pulleys. Work, energy and its transformations.

Surface tension, diffusion, osmosis.

Temperature and thermometry. Clinical and maximum and minimum thermometers.

Elementary qualitative treatment of expansion. Thermostat.

Quantity of heat and its measurement. Change of state.

Refrigeration.

Conduction, convection, radiation. Thermos flask.

Vapour pressure. Hygrometry. Ventilation and methods of heating home and hospital.

Variation of boiling point with pressure: autoclave steriliser.

Reflection and refraction of light.

Mirrors and lenses treated qualitatively.

The spectrum and colour. Infra-red and ultra-violet.

The camera. Telescope and microscope. The eye and spectacles.

Colour-blindness.

Methods of lighting in home and hospital.

Production and propagation of sound. Musical Sounds. Mitigation of noise. Resonance.

Stethoscope. Human voice. The ear.

Fundamental magnetic phenomena.

Magnetic, heating and chemical effects of the electric current.

Ohm's law. Lamps, heaters and fuses. The watt and kilowatt hour.

The dry cell and accumulator.

Electromagnetic induction. Ammeters and voltmeters. Induction coil.

Simple dynamo and motor. Transformers. The Grid.

Structure of the atom. Electric discharge through gases.

X-rays. Radioactivity.

Recommendations passed at joint meeting:—

1. All pupils should do some physics while taking the pre-nursing course.
2. If general science has been taken in the General School Certificate, two periods should be devoted to Physics with Chemistry.

3. If Biology only has been taken in the General School Certificate, 4 to 5 periods should be devoted to Physics with Chemistry.
4. Physics *with* Chemistry is the more convenient form.
5. Connecting-up and teaching Hygiene with the Physics and Chemistry course is strongly recommended.
6. Teaching of Physics along the lines required for the Higher School Certificate is not suited to those taking up nursing.

3. Practical Work.

(A). *Anatomy and Physiology in Schools.*

Practical work forms a very important part of the course. It should include:—

1. Simple experiments illustrating natural phenomena, which play an important part in the physiological processes of the body; *e.g.* osmosis, diffusion.

2. Physiological experiments performed as far as possible on the human body; *e.g.*, variation of pulse rate with exercise; determination of vital capacity. Experiments may also be performed on the tissues of a freshly chloroformed frog; *e.g.*, frog's heart, nerve muscle preparation.

3. Setting up of models to illustrate the working of the human body; *e.g.*, model chest to illustrate the mechanism of breathing; model to illustrate pressure conditions in the vascular system. Students should be encouraged to devise models for themselves.

4. Examination of the articulated and disarticulated human skeleton. This is the only way to acquire a knowledge of bones.

5. Examination of the muscular system by performing various movements, and noting which muscles are brought into action; *e.g.*, when jaws are closed tightly, masseter muscles swell near angle of the lower jaw; also by studying their position by models, and on the skeleton.

6. Dissection of Rabbit or Rat to show position and anatomy of various organs and comparison with organs in a human by means of a model.

Examination of the kidney, heart and brain of sheep and eye of ox.

7. Examination under the microscope of pieces of tissue taken from a newly killed animal, and prepared slides of histology of organs and tissues. Observation of the circulation of blood through the capillaries in the tail of a tadpole.

8. Simple biochemical experiments on blood, urine, food substances, digestion.

(B). *Hygiene of the Pre-Nursing Course.*

Practical work should include:—

1. Experiments on different types of materials used in making clothes.
2. More detailed experiments on food substances; *e.g.*, milk, meat, flour, cheese, bread. Experiments on food preservation.
3. Experiments on the atmosphere, natural forces which assist ventilation, practical points connected with ventilation, methods of heating a building. Model should be set up to show how water circulates in a house.
4. Examination of building sites, houses in the course of construction, sanitary fittings of a house. Model of damp-proof course.
5. Experiments on impurities in water, water purification, including water softening. Models to illustrate water supply from reservoir to houses.
6. Examination under the microscope and hand lens of specimens illustrating life history and structure of internal and external parasites.
7. Examination of bacteria under high power microscope. Simple cultures. Experiments to find conditions which encourage and discourage their growth.
8. Visits should be made to local waterworks, sewage farm, dairy, etc.

4. Suggested Equipment in Anatomy, Physiology and Hygiene.

1. Usual apparatus and reagents found in an elementary laboratory.
2. Articulated and disarticulated human skeleton.
3. Models, including:—
 - (i) Human Body, which takes to pieces.
 - (ii) Human Body in plaster, to show muscles.
 - (iii) Heart.
 - (iv) Eye.
 - (v) Ear.
 - (vi) Brain.
 - (vii) Half head.
 - (viii) Human skin.

4. Dissected rabbit, with blood vessels injected, preserved in formalin.

5. Wall charts, selected by the teacher from sets such as those published by Arnold, Rouilly.

6. Stethoscope; clinical thermometer; measuring pipette marked in cu. mm.; special slide for blood count; tuning forks; Whatman's diffusion shells.

7. Microscopes, and if possible a microprojector. The latter enables histology slides to be demonstrated easily to a group.

8. Slides. A. Histology slides. The following is a list of those shown at the Pre-Nursing Summer School, September, 1945:—

Suggestions for permanent slides:—

Section of epiglottis (for cartilage).

L.S. and T.S. of compact bone.

Section of spongy bone.

Slides showing different stages in the ossification of bone.

L.S. and T.S. of striped muscle—if possible with blood vessels injected.

Stained blood film.

T.S. of aorta.

T.S. of small artery.

T.S. of inferior vena cava.

T.S. of small vein.

Section of cardiac muscle.

Section through spleen.

Section through a lymph gland.

Section of tooth.

Sections of salivary glands: mucous (sub-lingual), serous (parotid), mixed (sub-maxillary).

T.S. of oesophagus.

T.S. of cardiac end of stomach.

T.S. of fundus end of stomach.

T.S. of duodenum.

T.S. of ileum.

T.S. of jejunum.

Slide of intestinal villi, injected to show blood vessels.

T.S. of large intestine.

T.S. of vermiform appendix.

Sections of liver (of pig and man)—if possible with blood vessels injected.

Section of pancreas.

Section of lungs.

T.S. of trachea.

Section of kidney with blood vessels injected, cut parallel to rays of medulla.

T.S. of kidney.

T.S. of ureter.

Slide of wall of bladder to show unstriated muscles.

Section of skin.

Section of scalp.

T.S. of spinal cord from cervical, dorsal, and lumbar regions.

Slide of nerve cells.

T.S. of medullated nerve.

Section through retina.

L.S. of cochlear.

Section through tubules of testis.

Section of ovary of young mammal.

Section of ovary of adult mammal.

T.S. of umbilical cord.

Section through mammary gland.

Sets of slides with accompanying text and figures may be borrowed from C. Baker, 244, High Holborn, London, W.C.1.

B. Slides of internal and external parasites.

9. Simple biological stains, *e.g.*, haematoxylin, Leishman's stain; and reagents, *e.g.*, Fehling's solution, Millon's reagent. Dried enzymes.

10. pH Comparator with phenol red and/or Universal Indicator in buffer tubes.

5. Book List. (With approximate prices). A selection from the following list is recommended:

- (a) *Anatomy and Physiology for Nurses*, by Evelyn C. Pearce. Price: 5s. Published by Faber & Faber. The new edition of this book is good and many of the diagrams are improved. It is a complete text-book for the preliminary examination and includes questions from recent examination papers.

- (b) *Anatomy, Physiology and Hygiene*, by Raeburn. Price: 6s. 6d. Published by Murray. This is a good book, with a sound scientific attitude, yet not too academic.
- (c) *Anatomy and Physiology for Nurses*, by W. Gordon Sears. Price: 6s. Published by Arnold. This is an attractive book and very readable. It has excellent diagrams.
- (d) *Manual of Human Physiology*, by Leonard Hill. Price: 7s. 6d. Published by Arnold. Written for the general reader, but recommended for nurses in training, this book seeks to train the student to train himself by observation, dissection and the performance of simple experiments. This is an excellent and readable book, containing useful experiments and helpful diagrams.
- (e) *Human Physiology*, by Furneaux. Price: 5s. 6d. Published by Longmans. (New Edition, 1942, by Smart). This is a sound book, but has rather difficult technical terms for average pupils of 16. It contains very little on the anatomy of muscles.
- (f) *Human Physiology*, by Stiles. Price: 15s. Published by W. B. Saunders. This is a good, readable book and is recommended by the Joint Matriculation Board for Subsidiary Higher Certificate Physiology.
- (g) *The Human Body and its Functions*, by Best and Taylor. Price: 25s. Published by Henry Holt. This readable book is scientifically accurate and has good diagrams, and is also recommended by the Joint Matriculation Board for Subsidiary Physiology.
- (h) "Aids Series." These books in the "Aids Series" are published by Baillière, Tindall & Cox. They are pocket editions, very useful and full of sound information.
 - (a) *Aids to Anatomy and Physiology*, by Katharine F. Armstrong. Price: 5s.
 - (b) *Aids to Hygiene*, by Edith M. Funnell. Price: 5s.
- (i) *Anatomy, Physiology and Hygiene for Nurses*, by Ashdown. Price: 6s. 6d. Published by Dent. This is an approved book and is good on the hygiene side.
- (j) *The Nurses' Handbook of Hygiene*, by L. E. H. Whitby, M.B. Price: 5s. Published by Faber & Faber. "For so small a work it is wonderfully comprehensive, and as an elementary text-book thoroughly to be recommended."
- (k) *Hygiene for Nursing Students*, by Agnes Pavey. Price: 6s. Published by Faber & Faber. This book covers the Nursing Syllabus and can be supplemented by other suitable text-books.
- (l) *Hygiene and Health Education*, by Davies. Price: 7s. 6d. Published by Longmans Green. This book deals specially with personal hygiene.

- (m) *A General Course in Hygiene*, by Ikin & Oates. Price: 5s. Published by London University Tutorial Press. It deals specially with public hygiene.
- (n) *Preliminary Textbook of Dietetics and Cookery*, by Wansbrough. Price: 5s. Published by Faber & Faber. This covers the Nursing Syllabus with particular reference to diets in diseases.
- (o) *Food Values in Wartime*. Price: 1s.
Food Values at a Glance. Price: 6s.
 Both are by Plimmer. Published by Longmans Green. They are good books for facts on food values, but they do not deal with diets in diseases.
- (p) *First Aid*, by Warwick and Turnstall. Price: 3s. 6d. Published by Simpkin, Marshall & Co. Contains good illustrations, particularly of joints.
- (q) *First Aid to the Injured*. Price: 2s. Published by St. John Ambulance Association.

6. Reference Books.

- (1) *Gray's Anatomy*. Price: 70s., but can be obtained second-hand. Published by Longmans. This is an excellent reference book for nursing students, particularly in the illustrations.
- (2) *Handbook of Physiology and Biochemistry*, by R. J. S. McDowall. Price: 30s. Published by Murray. This book has been published in a new edition and is a very useful reference book.
- (3) *Synopsis of Hygiene*, by Jameson and Parkinson. Price: 25s. Published by Constable. This book, used by candidates taking the Public Health Diploma at some Universities, is very good as a reference book.
- (4) *Anatomical Atlas*, by Burdon and MacDonald. Price: 6s. Published by Faber & Faber. This atlas contains 24 pages of diagrams, most of them in colour. It is "An excellent pictorial aid to anatomy."
- (5) *Anatomical Atlas*, by Maud Jepson. 8 $\frac{7}{8}$ " x 11 $\frac{1}{2}$ ". Price: 2s. 6d. Published by John Murray. This Atlas contains very clear and well-labelled diagrams and should be a great asset to the school course.
- (6) *Elementary Practice of Nursing*, by Millicent Ashdown. Price: 12s. 6d. Published by Dent. This book is full of useful diagrams and helps greatly in the reference to applications of nursing that are so necessary.
- (7) *The Living Body*, volume 1 of the "Science of Life." by Wells and Huxley. Price: 5s. Published by Cassell. This volume is useful for reference and is scientific yet popular.
- (8) *Anatomy and Physiology*, by Robbins. Price: 7s. 6d. Published by Faber & Faber. This is a sound book, very useful for anatomy. It has a good glossary.
- (9) *Food and the Principles of Dietetics*, by Hutchinson & Mottram. Price: 21s. Published by Arnold.

- (10) *Nurses' Complete Medical Dictionary*, by Hitch & Marshall. Price: 3s. 6d. Published by Baillière, Tindall & Cox.
- (11) *The Nurses' Dictionary*, by Florence Taylor. Price: 3s. 6d. Published by Faber & Faber. This is a most useful and compact pocket-book.
- (12) *A Complete Handbook of Hygiene in Questions and Answers*, by Evelyn C. Pearce. Price: 4s. Published by Faber & Faber. This little book is excellent for revision and in preparation for examination.
- (13) *Preliminary Questions and Answers*. Price: 2s. 6d.
- (14) *Oral Tests*. Price: 2s.
Both by Felicie Norton. Published by Faber & Faber. These small books are very useful when preparing for the examination.
- (15) *The Nursing Mirror*. Price: 4d. weekly. This periodical is useful for practical applications of the subject.
- (16) *The Nursing Times*. Price: 3d. weekly. This is the official publication of the Royal College of Nursing.

7. Additional Book List, more recently compiled than Sections 5 and 6.

A selection from the following list is recommended.

Vocational Subjects (Anatomy, Physiology and Hygiene).

For the Tutor or Teacher.

Anatomy and Physiology for Nurses, by Grove, Nixon & Brickdale. Price: 25s.

Notter & Firth's Hygiene, revised by Adam & Boome. Published by Longman. Price: 12s. 6d.

Physiology and Anatomy, by Esther Greisheimer. Published by Lippincott Co. Price: 21s.

Hygiene, by Currie & Mearns. Published by Livingstone. Price: 21s.

For the Student.

Elementary Hygiene for Nurses, by H. C. R. Darling. Published by A. & J. Churchill. Price: 6s.

The Miracle of the Human Body, by Harry Roberts. Published by Odhams Press Ltd. Price: 7s. 6d.

Elementary Anatomy and Physiology, by Whillis. Published by Churchill. Price: 15s.

Illustrations of Regional Anatomy. Price: 75s. Also in seven loose leaf sections.

Illustrations of Anatomy for Nurses. Price: 8s. 6d. Both are by Jameson. Published by E. & S. Livingstone.

Introduction to Physiology, by Newton. Published by Arnold. Price: 7s. 6d.

Laboratory Manual of Anatomy and Physiology, by Millard and Showers. Published by W. B. Saunders & Co. Price: 7s. 6d.

Handbook of Hygiene and Health Education, by Eastwood. Published by Arnold. Price: 7s. 6d.

Ancillary Subjects (Physics, Chemistry, Biology, Arithmetic).

1.—*Physics.*

For the Tutor or Teacher.

Modern Physics, by C. E. Dull. Published by Harrap. Price: 12s. 6d.

Electrical Handbook for Women, by C. Haslett. Published by English University Press. Price: 5s.

New Elementary Physics, by Millikan, Gale & Coyle. Published by Ginn. Price: 11s.

General Physics, by F. Oldham & E. Laughton. Published by University of London Press. Price: 8s. 6d.

For the Student.

Household Physics, by Avery. Published by Macmillan. Price: 16s.

Hydrostatics and Mechanics, by A. E. E. McKenzie. Published by Cambridge University Press. Price: 4s. 6d.

Heat, by A. E. E. McKenzie. Published by Cambridge University Press. Price: 3s. 6d.

Light, by A. E. E. McKenzie. Published by Cambridge University Press. Price: 3s. 6d.

Sound, by A. E. E. McKenzie. Published by Cambridge University Press. Price: 3s. 6d.

Magnetism and Electricity, by A. E. E. McKenzie. Published by Cambridge University Press. Price: 6s.

Everyday Electricity and Magnetism and Everyday Heat, Light and Sound, by A. C. Penney. Published by Arnold. Price: 4s. 6d. and 5s. 0d. respectively.

Elementary Physics for Nurses, by M. Waters. Published by Faber & Faber. Price: 7s. 6d.

Elementary Physics, by G. Stead. Published by Churchill. Price: 14s.

School Physics, by Pearce. Published by Bell. Price: 5s. 6d.

The New Practical Physics (books 1-5), by Anniss. Published by Gregg Publishing Co. Price: Pt. I, 3s.; II, 3s.; III, 3s. 6d.; IV, 4s. 6d.; V, 3s.

II.—*Chemistry.*

For the Tutor or Teacher.

Everyday Chemistry, by Partington. Published by Macmillan. Price: 10s.

Pamphlet entitled "List of Books suitable for use in VIth Form Science." Courses for Non-Specialists. (For more details—see page 35).

For the Student.

Chemistry with some Geology, by Lauwerys & Ellison. Published by University of London Press. Price: 6s. 6d.

Organic Chemistry, by Hammick. Published by Bell. Price: 5s.

School Certificate Chemistry, by Holderness & Lambert. Published by Heineman. Price: 7s. 6d.

Chemistry applied to the Home and Community, by Beery. Published by Lippincott. Price: 15s.

III.—Biology.

For the Tutor or Teacher.

Animal Biology, by Grove & Newell. Published by University Tutorial Press. Price: 17s. 6d.

Economic Biology. Parts I and II, by Philippa Esdaile. Price: 7s. 6d. and 10s. 6d. respectively. Published by University of London Press.

Man and Other Living Things, by Francis Knowles. Published by Harrap. Price: 12s. 6d.

For the Student.

Pelican and Penguin Series, such as:—

(a) *Beyond the Microscope*.

(b) *Biological Control of Insects*.

(c) *Biology*. Price: 1s. each.

Living Things, by Richard Palmer. Published by Allen & Unwin. Price: 6s. 6d.

An Experimental Human Biology, by Cyril Bibby. Published by Heineman. Price: 3s. 6d.

The Body and its Health, by Winifred Cullis and Muriel Bond. Published by Allen & Unwin. Price: 5s.

IV.—Arithmetic.

For the Tutor or Teacher.

An Arithmetic of Citizenship, by E. Riley and J. Riley. Published by Sidgwick & Jackson. Price: 2s.

Civic Arithmetic (3 books), by E. M. Rogers. Published by Black. Price: 1s. each.

Functional Arithmetic through Citizenship (4 books), by J. Morley and J. Trevelyan. Published by Longman, Green & Co. Price: 1s. 9d. each.

Arithmetic of Daily Life (3 books), by J. Webb and C. Hill. Published by Cambridge University Press. Price: 2s. 10d. each.

Everyday Life Arithmetic (books I, II, III), by W. G. Bate. Published by Pitman. Price: 1s. each (out of print).

Arithmetic for Women's Trades, by E. Farina. Published by Pitman. Price: 3s. 6d. (out of print).

Everyday Arithmetic and Accounts, by Beard. Published by Oxford University Press. Price: 1s. 6d. (out of print).

For the Student.

Arithmetic of Everyday Affairs, by Hunt. Published by Oliver & Boyd. Price: 1s. 4d.

Larcombe's Speed Tests in Mental Arithmetic (Seniors). Published by Evans Bros. Price: Part I, 11d., Part 2, 11d., Part 3, 1s.

Larcombe's Senior Arithmetic (Books III & IV). Published by Evans Bros. Price: Part 3, 1s., Part 4, 1s. 6d.

For more general reading and for books on History of Nursing and Medicine reference should be made to the list entitled: "List of Books recommended for VIth Form Science Courses for Non-Specialists."

This list was circulated to all Schools where there were members of the Association of Assistant Mistresses in 1944. Members can still obtain a copy on application to: The Secretary of the Association of Assistant Mistresses, 29, Gordon Square, London.

Other books recommended for general reading:

Story of the Growth of Nursing, by Pavey. Published by Faber & Faber. Price: 15s.

History of Medicine, by Singer. Published by Oxford University Press. Price: 10s. 6d.

History of Biology, by Singer. Published by Oxford University Press. Price: 10s. 6d.

History of Medicine, by Guthrie. Published by Nelson & Sons. Price: 30s.

Pioneers of Medicine, by Wallis & McNicol. Published by Oxford University Press. Price: 1s. 6d.

Seven Biologists, by Savory, Joselin and Walton. Published by Oxford University Press. Price: 1s. 6d.

Man against Microbe, by Bigges. Published by English University Press. Price: 7s. 6d.

Battle for Health, by Stephen Taylor. Published by Nicholson & Watson. Price: 5s.

8. Firms supplying Books, Charts and Equipment.

(a) *Books and Charts*—

H. K. Lewis & Co., Ltd., 136, Gower Street, London, W.C.1.

George Philip & Son, Ltd., 32, Fleet Street, London, E.C.4.

T. Gerrard & Co., Ltd., 46a and 48, Pentonville Road London, N.1.

E. J. Arnold & Son, Ltd., Butterley Street, Hunslet Lane, Leeds.

W. & G. Foyle, Ltd., 111, Charing Cross Road, London, W.C.2.

Messrs. H. G. Gratton, 21, Borough High Street, London, S.E.1.

(b) *Equipment*—

T. Gerrard & Co., Ltd., 46a and 48, Pentonville Road,
London, N.1.

Adam Rouilly & Co., 18, Fitzroy Street, London, W.1.

Lt.-Col. Brereton, Heath Barn, Hemel Hempstead, Herts.
(For Models).

9. Bursaries and Maintenance:—

Pupils in regular attendance at full time Pre-Nursing Courses, which are provided by some Local Authorities, are normally eligible for Bursaries and Maintenance Grants, the amount of which varies according to the parents' income. Pupils may be awarded Bursaries and Grants in Aid without necessarily having passed a School Certificate Examination.

10. Information on the Pre-Nursing Courses:—

This can always be obtained from:

Miss Edwards, The Organising Secretary,

The Nursing Recruitment Centre,

21, Cavendish Square, London, W.1.

11. Recruitment:—

The Nursing Recruitment Centre sends speakers to schools, to give talks on Nursing as a Career and on the best means of preparing for it. It is essential that the right type of girl should be encouraged to take the Nursing Course, namely, one who has or always has had a keen desire to enter the nursing profession, one who is physically strong and one who will enjoy the extra Sixth Form Year's academic study in Anatomy, Physiology and Hygiene for the Preliminary Examination.

1949 Additional Bibliography.

Social Biology, by Alan Dale. Published by Heineman. Price: 15s.

The Romance of Medicine, by Hayward. Published by Routledge. Price: 6s.

The Peckham Experiment, by Pearce & Crocker. Published by Allen & Unwin. Price: 12s. 6d.

Biologists in Search of Material. Published by Williamson & Pearce. Price: 2s. (Interim Report on Peckham Health Centre).

Health, The Unknown, by Connerford. Published by Hamish Hamilton. Price: 7s. 6d. (The Story of Peckham Health Centre).

Selected Readings in the History of Physiology, by Fulton. Published by Baillière. Price: 22s. 6d.

Introduction to Pharmacology and Therapeutics, by Gunn. Published by Oxford Medical Publications. Price: 5s.

Practical Anatomy, Physiology and Hygiene, by J. K. Raeburn. Published by John Murray. Price: 6s.

PART III.

SYNOPSIS OF SIXTH FORM NURSING COURSE.

Time Tables from Five Schools.

SCHOOL 1.

TIME ANALYSIS OF ONE-YEAR PRE-NURSING COURSE

The week consists of 40 periods of 35 or 40 minutes' duration each.

	Periods
Anatomy and Physiology	8 (in 4 double periods)
Hygiene	2
Dietetics and Cookery	3 (in 1 long period)
First Aid	2
General Science	4 (in 2 double periods)
Arithmetic	1
Special Physics (for a few who are going on to Radiography, etc.)	3 (in 1 long period)
English	3
Civics	1
French	2
Scripture	1
Physical Training	2
Games	2
Preparation and Private Study	about 3 to 6
Regular attendance at local hospital	1 afternoon (<i>i.e.</i> 3 periods).

Notes:

1. Pupils will normally have taken their School Certificate Examination.
2. Most pupils will have studied General Science for five years and will have taken this in their School Certificate Examination.
3. In addition to intending nurses, the course is open to those who intend to take up Radiography, Massage, Domestic Subjects, Gymnastics, etc., for whom suitable modifications can be made.

SCHOOL 2.

TIME ANALYSIS OF ONE-YEAR PRE-NURSING COURSE.

The week consists of 35 periods.

<i>Special Subjects:</i>	Periods
(a) Anatomy with Physiology	3
(b) Biology with Physiology	3
(c) Hygiene	4
(d) First Aid	1

General Subjects:

French or other optional subject	2
English	3
Scripture	1
History (current events)	2
Cookery	4
Music and Singing	2
Arithmetic	1
Gymnastics and Games	4

Notes:

1. Pupils in this course will normally have obtained a School Certificate, although failure to obtain such a Certificate will not necessarily exclude them from the course. All candidates will have normally studied General Science for five years and will have taken this subject in the School Certificate.
2. In addition to intending nurses, the course is open to those hoping to take up Gymnastics, Gardening, Domestic Subjects, Radiography, Physiotherapy, Massage.
3. Anatomy, Hygiene, Cookery and Arithmetic are taken as special syllabuses; Biology with Physiology is taken with the first-year Higher Certificate class, and this includes the Histology; the rest of the subjects are taken with other Lower Sixth classes.

SCHOOL 3.

TIME ANALYSIS OF ONE-YEAR PRE-NURSING COURSE

The week consists of 35 periods, apportioned as follows:

	Periods
Anatomy, Physiology and Hygiene	4
Chemistry	4

Physics	4
General Biology (Lecture Course)	1
Cookery and Dietetics	4
Needlework or Music Appreciation or Art and Craft or Gardening	2
Scripture	1
English	3
Current Events	1
Arithmetic	1
Art Appreciation	1
Class Music	1
Physical Training (Gymnastics, Dancing and Games)	4
Private Study	4

Notes:

1. Entrants to the course will normally have passed the School Certificate Examination, though in exceptional circumstances a candidate who was slightly below the Pass standard might be admitted. All candidates will have had a three-year General Science Course in the Main School, and all will have offered Biology or General Science (two credits) as a School Certificate subject.
2. In addition to intending nurses, the course is followed by intending Domestic Science Mistresses, Institutional Housekeepers, Gymnastics Mistresses, Agriculturalists and Horticulturalists.
3. Certain of the subjects (*i.e.*, Scripture, English, General Biology, Class-Singing, Art Appreciation and Physical Training) are taken with the whole of the "Science" Lower Sixth. Other subjects (*i.e.*, Anatomy, Physiology, and Hygiene, Chemistry and Physics) have special syllabuses designed to suit the group of girls mentioned in Note 2.

SCHOOL 4.

TIME ANALYSIS OF TWO-YEAR PART-TIME PRE-NURSING COURSE.

Anatomy and Physiology	2	hours per week for 6 terms
Hygiene and General Science	2	,, ,, ,, ,, 6 ,,
English	$\frac{3}{4}$	hour ,, ,, ,, 5 ,,
Arithmetic	$\frac{3}{4}$	,, ,, ,, 5 ,,
Cookery	2 $\frac{1}{2}$	hours ,, ,, ,, 1 term,

Notes:

1. Candidates in this course have left school and are engaged in part-time work at Clinics or Nursery Schools.
2. If from Secondary Grammar Schools, candidates will have taken the School Certificate Examination. Failure to obtain a Certificate will not exclude them from the course.

If from Modern Schools, candidates take a preliminary course in General Science, Arithmetic and English, until they reach the age of 16, when they may join the Pre-Nursing Class.

SCHOOL 5.

TIME ANALYSIS OF PRE-NURSING COURSE IN A COUNTY TECHNICAL SCHOOL FOR GIRLS

The week consists of 40 periods of 40 minutes. Periods

Anatomy and Physiology	2*
Biology, including some Physiology	3
Hygiene	2
Child care	1
First Aid and Home Nursing	1
Chemistry and Physics	5
Cookery	3
Dietetics	2
Needlework	2
Hand-crafts	2
Art	2
Music and Singing	1
Religious Instruction	1
English	5
Current Affairs	1
Physical Education	3
French or Mathematics	3
or Arithmetic	2

Notes:

1. Pupils are drawn from both technical and grammar schools. French or mathematics is available for grammar school pupils if desired: other adjustments are also made for them if necessary. A term's course on Language with special reference to derivation of technical terms used in Anatomy and Physiology is available for pupils having no previous acquaintance with Latin.

2. A member of the medical profession gives the lectures started.
3. Included in the course are visits to hospitals, local clinics, water-works, dairies, etc. Lectures on related topics are given by outside lecturers, chiefly members of the medical profession and Public Health Departments.
4. The length of the course varies from one to two years and is normally of eighteen month's duration.
5. Technical school pupils have had a course of Hygiene and General Science (5 periods a week) for two years before entering the Pre-Nursing Course.

PART IV.

A BRIEF ACCOUNT OF THE WORK OF THE ASSOCIATION OF WOMEN SCIENCE TEACHERS IN CONNECTION WITH THE PRE-NURSING COURSE

The first edition of the present brochure "The Pre-Nursing Course" was published in 1943. Soon after this, in April 1943, the Association was invited to act in a consultative capacity with others and with representatives of the Science Masters Association Co-ordination and Guidance Committee for the Teaching of Physics, upon a committee of the Royal College of Nursing which subsequently prepared the Physics syllabus for the Nursing Reconstruction Committee Report, Section 2, Education and Training (Horder Report).

In July, 1943, the Association of Women Science Teachers was approached by the Ling Physical Education Association with a view to organising a summer school for the science and physical education teachers in schools who prepare pupils for the Pre-Nursing Course. As a result, a joint committee of the two associations was set up, to which sister tutors were invited in a consultative capacity. This committee ran a most successful course for these teachers, at Battersea Polytechnic in September, 1945. A full account of the proceedings of the course appeared in "The School Science Review," of June, 1946.

During the vacations of 1946, certain of the London Matrons* very generously offered to take limited numbers of teachers who had attended the Battersea course, for four or five days each, as observers of their Preliminary Training Schools. All the teachers attending have testified to the value and interest of these visits. As a follow up to this, the Association of Women Science Teachers is asking all its members to consult with their headmistresses with a view to inviting sister tutors and local health visitors to visit as observers those schools in their districts where Pre-Nursing Courses are held. Much importance is attached to these mutual contacts between members of the nursing and teaching professions, not only by committees, but by individuals also.

In the Autumn of 1946, a joint standing committee was set up, between the Association of Women Science Teachers, the Ling Physical Education Association and the Sister Tutor Section of the Royal College of Nursing. The terms of reference of this committee are as follows:—‘The committee shall consider and arrange for any activities that will prove of mutual benefit to members dealing with the Pre-Nursing Course or Preliminary Training Course in the three bodies represented.’ So far the work of this committee has been concerned with the planning of vacation courses for teachers of the Pre-Nursing Course belonging to the two teachers’ associations, in which sister tutors are invited to participate. A course on anatomy and the teaching of anatomy was arranged for September, 1947, at Battersea Polytechnic and at St. Thomas’ Hospital Medical School, by kind permission and co-operation of the authorities concerned. This course has been followed by one for Physiology in 1948 at Birmingham University Medical School, under the direction of Professor Gelding. Domestic subjects teachers taking part in Pre-Nursing Courses will be invited to the Hygiene Course when this can be arranged.

In order to help still further the teachers in the schools, the Association of Women Science Teachers makes contact with the medical schools and polytechnics of England, with a view to making arrangements whereby the teachers may attend evening classes in anatomy and physiology on a local or regional basis.

*The Matrons of Guy’s Hospital, The London Hospital, St. Thomas’ Hospital and University College Hospital.

PART V.

BEFORE THE PRE-NURSING COURSE.

It has recently become apparent that a gap exists in the case of girls at the secondary modern school (as indeed it did for girls at the old senior school) between the ages of 15 and 16 years, when they normally start a Pre-Nursing Course at a secondary grammar or technical school; or between the ages of 15 and 18 years, when they normally commence as probationers in a Preliminary Training School of a hospital. It is felt that many possible recruits to the nursing profession are thus being lost; the girls lose interest in their possible first vocational aspirations and enter industry or commerce or local shop assistancy.

The question has been asked—what can be done to keep the interest of these girls in nursing until they are old enough to commence the preliminary studies? One answer is, that the girls can be transferred, under the regulations of Paragraphs 12 and 13 of Circular 1471, to another secondary school in the district, with a view to entering the Pre Nursing Course class at 16 years of age. This transfer would normally take place at 13 years and exceptionally at 16 years of age. Another answer is, that in some areas the girls take part-time employment and part-time study at 16 years in a Pre-Nursing Course in a secondary school. But these proposals would not solve the difficulty of the gap from 15 to 16 years. The solution to the problem here might be that classes in Mothercraft could very profitably be given to girls of 13 years rather on the lines of the Mothercraft C. syllabus of the National Association of Maternity and Child Welfare Centres and the Prevention of Infant Mortality. These classes might be followed up by a course of child care for girls of 14 years, such as is recommended in "Training in Child Welfare," a report of the Group Committee of the National Council for Maternity and Child Welfare. A quotation from this report is of value:—"Child care might be taught with domestic science throughout the last year at school. This would allow time not only for theoretical work but also for practical work in relating cooking, needlework, etc., to the needs of children, visits for observation of babies and participation in nursery routine. Alternatively, where

the project method is used in teaching, a 'project' for the last term at school might be one on home making, including the care of children. The contents of such a course would vary according to the age of the children and the district in which they lived, since school and home community would be closely linked. The centre of interest would be the home and there would be opportunity for social studies concerned with the provision of food, clothing and household equipment, with social services in the district, and with the history of everyday things; practical art and skills would be developed through interior decoration, embroidery, dressmaking, carpentry or handyman's jobs; household management would require intelligent planning of the budget; scientific understanding would be developed through sound training in child care, hygiene, cookery, housewifery and a knowledge of the working of the equipment of the modern home. A course of this kind with home and the upbringing of children as the pivot would be both coherent and interesting, and would be looked forward to as a culminating point of school life."

When the school leaving age is raised to 16 years, it is possible that the Mothercraft and Child Care classes would be profitably advanced for girls of 14 years and 15 years respectively. Then the girl with interest in nursing would be able to pass straight on to the Pre-Nursing Course at the local grammar or technical school, entering the sixth form.

At the moment, however, there will still be the gap from 15—16 years, and it is recommended that this problem be tackled forthwith and jointly by the Ministry of Education and the General Nursing Council in collaboration with Local Authorities and the Ministry of Labour. If some scheme for part-time education in general science, domestic subjects and further courses in Mothercraft and Child Care could be devised, this might solve the problem of the wastage of potential nurses at 15 years, until the raising of the school leaving age to 16 years is a fact.

